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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,655	02/01/2006	Shingo Tode	MAM074	7530
7590 Kubovcik & Kubovcik The Farragut Building Suite 710 900 17th Street NW Washington, DC 20006		EXAMINER O'NEILL, KARIE AMBER		
		ART UNIT 1795		
		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/566,655

**Applicant(s)**

TODE ET AL.

**Examiner**

Karie O'Neill

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 February 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3 and 5-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-3, 5-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 01 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 2-1-06  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Claim 4 has been canceled and Claims 9-12 have been added as new in a Preliminary Amendment dated February 1, 2006. Therefore, Claims 1-3 and 5-12 are pending in this office action.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d) or (f), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

3. Information disclosure statement (IDS), submitted February 1, 2006, has been received and considered by the examiner.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 6 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakane et al. (US 2003/0180620 A1).

Nakane et al. discloses a non-aqueous electrolyte secondary battery which has a positive electrode containing a positive active material, a negative electrode containing a negative active material and a non-aqueous electrolyte solution, said secondary battery being characterized in that said positive active material comprises a lithium transition metal complex oxide containing at least Ni and Mn as transition metals and having a layered structure (paragraphs 0034-0036) and further contains zirconium in the amount within a range of no more than 50% by mole of the respective sites, based on the total amount of said transition metals. Nakane et al. discloses that the respective sites of lithium, nickel, manganese and cobalt may be replaced with any number of metal elements, including zirconium (paragraph 0036). Nakane et al. also discloses wherein the lithium transition metal complex oxide is represented by a chemical formula:  $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$  (a, x, y and z satisfy  $0 \leq a \leq 1.2$ ,  $x + y + z = 1$ ,  $0 < x \leq 0.5$ ,  $0 < y \leq 0.5$  and  $z \geq 0$ ), and the amount of Ni and Mn is substantially the same amount (paragraph 0035). This can be seen in Example 6 where the amount of Ni and Mn is 0.40, and in Example 7 where Ni is 0.31 and Mn is 0.43, which are substantially the same amount (paragraphs 0097-0103).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 3, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakane et al. (US 2003/0180620 A1).

With regard to Claim 2, Nakane et al. discloses the maximum charging voltage at 4.3V (paragraph 0068). Nakane et al. does not disclose wherein in a fully charged state the positive electrode has a potential of at least 4.5V. However, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply a maximum voltage of at least 4.5V and to use materials which would provide the positive electrode with the ability have a fully charged potential of at least 4.5V, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05.

With regard to Claim 3, Nakane et al. discloses a non-aqueous electrolyte secondary battery which has a positive electrode containing a positive active material, a negative electrode containing a graphite material as a negative active material (paragraph 0043) and a non-aqueous electrolyte solution and a maximum charging voltage of 4.3V (paragraph 0068), said secondary battery being characterized in that said positive active material comprises a lithium transition metal complex oxide containing at least Ni and Mn as transition metals and having a layered structure (paragraphs 0034-0036) and further contains zirconium in the amount within a range of no more than 50% by mole of the respective sites, based on the total amount of said transition metals. Nakane et al. discloses that the respective sites of lithium, nickel,

manganese and cobalt may be replaced with any number of metal elements, including zirconium (paragraph 0036). Nakane et al. does not disclose wherein the battery is designed to be charged with an end of charge voltage of at least 4.4V. However, at the time of the invention, it would have been obvious to one of ordinary skill in the art to apply an end of charge voltage of at least 4.4V and to use materials which would provide the positive electrode with the ability have a end of charge voltage of at least 4.4V, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. See MPEP 2144.05.

With regard to Claims 10 and 11, Nakane et al. also discloses wherein the lithium transition metal complex oxide is represented by a chemical formula:  $\text{Li}_a\text{Mn}_x\text{Ni}_y\text{Co}_z\text{O}_2$  (a, x, y and z satisfy  $0 \leq a \leq 1.2$ ,  $x + y + z = 1$ ,  $0 < x \leq 0.5$ ,  $0 < y \leq 0.5$  and  $z \geq 0$ ), and the amount of Ni and Mn is substantially the same amount (paragraph 0035). This can be seen in Example 6 where the amount of Ni and Mn is 0.40, and in Example 7 where Ni is 0.31 and Mn is 0.43, which are substantially the same amount (paragraphs 0097-0103).

8. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakane et al. (US 2003/0180620 A1), as applied to Claims 1 and 3 above, and in further view of Uemura et al. (US 2002/0012830 A1).

Nakane et al. discloses the non-aqueous electrolyte secondary battery in paragraphs 5 and 7 above, but do not disclose wherein a ratio in capacity of said negative electrode to said positive electrode (negative electrode/positive electrode) in their portions opposed to each other is in the range of 1.0 - 1.3.

Uemura et al. discloses a rechargeable lithium battery including a positive electrode with a positive active material made of a layered lithium manganese complex oxide, such as  $\text{Li}_2/3\text{Mn}_{1/2}\text{Ni}_{1/2}\text{O}_2$  (paragraphs 0035 and 0041). Uemura et al. also discloses a capacity balance ratio  $B/A$  of the total capacity  $B$  of the negative electrode material to the total capacity  $A$  of the positive electrode material is preferably fixed at a range of 1 to 1.5. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to have a ratio capacity of said negative electrode to positive electrode in the range of 1.0-1.5 in the battery of Nakane et al., because Uemura et al. teaches that if the capacity balance ratio  $B/A$  is below 1, lithium ion holding sites on the negative electrode material become insufficient. As the result, branch-shaped or needle-shaped crystal (dendrite crystal) tends to occur during the charge to cause a short circuit phenomenon between the positive electrode and the negative electrode. If the capacity balance ratio  $B/A$  exceeds 1.5, negative electrode sites that do not contribute to the charge-discharge are increased, leading to the wasteful use of materials (paragraph 0033).

9. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakane et al. (US 2003/0180620 A1), as applied to Claims 1 and 3 above, and in further view of Yageta et al. (US 2001/0018149 A1).

Nakane et al. discloses the non-aqueous electrolyte secondary battery in paragraphs 5 and 7 above, but do not disclose wherein said positive active material has a specific surface area of  $0.1 - 2.0 \text{ m}^2/\text{g}$ .

Yageta et al. discloses a secondary lithium battery including a positive electrode with a positive active material made of a lithium manganese compound oxide mixed with a lithium nickel compound oxide. Yageta et al. discloses wherein the positive electrode has a specific surface area of  $0.3 \text{ m}^2/\text{g}$  or above and  $5.0 \text{ m}^2/\text{g}$  or below, preferably  $3.0 \text{ m}^2/\text{g}$  or below (paragraph 0065). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a positive electrode with a specific surface area of  $0.3 \text{ m}^2/\text{g}$  to  $3.0 \text{ m}^2/\text{g}$  in the battery of Nakane et al., because Yageta et al. teaches that when it is above  $0.3 \text{ m}^2/\text{g}$  the electrolyte is effectively protected from deterioration and when it is  $3.0 \text{ m}^2/\text{g}$  or below it is easier to coat the electrode (paragraph 0065).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karie O'Neill  
Examiner  
Art Unit 1795

KAO

/Mark Ruthkosky/

Primary Examiner, Art Unit 1795